

IN THE CLAIMS:

Please CANCEL without prejudice or disclaimer claims 1-24 in the underlying PCT application. Please also cancel, without prejudice or disclaimer claims 1-24 in the annex to the International Preliminary Examination Report (IPER). and ADD new claims 25-48 in accordance with the following:

25. (new) A measurement element for determination of a flow rate of a fluid which is flowing around said measurement element in a flow channel, comprising:

an optical waveguide carrying an electromagnetic wave along a longitudinal extent thereof;

at least two fiber Bragg grating sensors in said optical waveguide; and

at least one electrical heating element, arranged adjacent to and applying heat to said optical waveguide, the electromagnetic wave carried by said optical waveguide being influenced, dependent on the flow rate of the fluid, as a function of temperature of said optical waveguide where said fiber Bragg grating sensors are located.

26. (new) The measurement element as claimed in claim 25, wherein said measurement element has a form of a rod.

27. (new) The measurement element as claimed in claim 26, wherein said measurement element is elastic.

28. (new) The measurement element as claimed in claim 27, wherein said heating element is formed from metal.

29. (new) The measurement element as claimed in claim 28, wherein said heating element is formed by an electrically conductive coating on said optical waveguide.

30. (new) The measurement element as claimed in claim 29, wherein said heating element has a constant electrical resistance per unit length.

31. (new) The measurement element as claimed in claim 30, wherein the resistance per unit length is largely independent of the temperature in an operating temperature range of said measurement element.

32. (new) The measurement element as claimed in claim 29, further comprising a sheath around said optical waveguide.

33. (new) The measurement element as claimed in claim 32, wherein said sheath is composed of a ceramic material.

34. (new) The measurement element as claimed in claim 32, wherein said sheath is composed of metal.

35. (new) The measurement element as claimed in claim 34, wherein said sheath forms said heating element.

36. (new) The measurement element as claimed in claim 28, wherein said heating element is a heating conductor formed in a loop.

37. (new) A method for determination of a flow rate of a fluid in a flow channel using a measurement element around which the fluid flows, comprising:

injecting an electromagnetic wave into an optical waveguide incorporated into the measurement element and including at least two fiber Bragg gratings at different locations along a longitudinal extent of the optical waveguide, the optical waveguide having an influence on the electromagnetic wave as a function of local temperature; and

determining the flow rate of the fluid from the influence of the optical waveguide on the electromagnetic wave where the at least two fiber Bragg gratings are located.

38. (new) The method as claimed in claim 37, further comprising generating the electromagnetic wave by an electromagnetic pulse.

39. (new) The method as claimed in claim 38, further comprising heating the measurement element along the longitudinal extent thereof by a heating element during measurement.

40. (new) The method as claimed in claim 39, wherein a constant electric current is applied to the heating element .

41. (new) The method as claimed in claim 40, further comprising repeating said heating and determining with different amounts of heat applied to obtain at least two measurements.

42. (new) The method as claimed in claim 41, wherein said determining the flow rate of the fluid along the longitudinal extent of the measurement element is based on a difference between the at least two measurements with the different amounts of heat applied.

43. (new) The method as claimed in claim 42, wherein a gas flow of a gas turbine is used as the fluid.

44. (new) A continuous flow machine, comprising:
a housing having stator blades rotationally fixed;
a rotor shaft rotatably mounted in said housing;
rotor blades arranged on said rotor shaft; and
at least one measurement element as claimed in claim 35, arranged in a flow channel in said continuous flow machine for measurement of a fluid flow rate.

45. (new) The continuous flow machine as claimed in claim 44, wherein said at least one measurement element is arranged radially with respect to an axis of said rotor shaft in the flow channel.

46. (new) The continuous flow machine as claimed in claim 45, wherein said at least one measurement element is arranged coaxially with respect to the axis of said rotor shaft along a circular line in the flow channel .

47. (new) The continuous flow machine as claimed in claim 46, wherein said at least one measurement element includes a plurality of measurement elements arranged axially spaced apart from each other in the flow channel.

48. (new) The continuous flow machine as claimed in claim 47, wherein the flow rate of the fluid is determined using a method as claimed in claim 43.